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Determinants of Growth in Government Expenditure: An Empirical Analysis of Nigeria

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ABSTRACT

This study seeks to ascertain the growth in government expenditure and determine the factors responsible for this growth. In this study, we examined 4 determinants of growth in public expenditure: Inflation, Public debt, tax revenue and population. The data collected for these variables were subjected to the ordinary least square regression analysis. The results indicate that: inflation has a negative relationship with total government expenditure (TGEX); population has a positive relationship with TGEX; public debt has a significant positive relationship with TGEX; and tax revenue has a significant positive relationship with TGEX. This shows that these variables are the major determinants of growth in the Government Expenditure. We recommend, therefore, that the fiscal responsibility bill in the National Assembly should always be passed into law on time to reduce budget deficit and public debt and their effects on the economy.

Key words: Inflation, public debt, population, tax revenue, national income, wealth, national budget, deficit

INTRODUCTION

Developing economies have been faced with an increasing size of government operations and its impact on economic growth has become an emerging major public debate. However, the observed growth in public spending appears to apply to most countries regardless of their level of economic development. Wagner (1883) formulated the law of expanding state activity which states that government spending leads to higher levels of economic development.

The Nigerian government, which is the focus of this study, has passed through different administrations. Each of these administrations embarked on different policies that have affected the generality of the people, such policies include education, health, defence, industrial and rural community developments.

The objectives of this study therefore are to ascertain the growth in government spending and determine the factors that are responsible for the growth in government expenditure since 1999.

Public expenditure involves all the expenses which the public sector incurs for its maintenance for the benefit of the economy (Anyanwu, 1997). Okoh (2008) sees government expenditures as the expenses the government incurs in carrying out its programmes. Also, according to Oriakhi (2004) government expenditures are the expenses which government incur for the maintenance of the government and the society in general.

Wagner (1883), on the basis of empirical findings, came up with a view that there was a long-run tendency for state activities to grow relative to the growth in national income. The conventional interpretation of Wagner's law implies a continuous relative expansion of public spending as a

consequence of the development process. Wagner explained that as a society becomes industrialized, the set of social, commercial and legal relationship within it become more complex. Government would be called upon to play a more prominent role in setting up and running institutions to control this complexity. These regulatory and protective functions of the state would cause an enlargement in the size of the public budget. Wagner reasoned that many public outputs are income elastic so that as development progresses and per capita income increases demand for these public output increases by a larger percentage. As the public sector responds to the increasing demand for its goods and services, the budgetary outlays which accompany them increase and consequently, the relative size of public expenditure expands.

Since, Wagner never indicated whether his findings were either in absolute or relative terms, Musgrave (1969) chose to interpret Wagner's law in relative terms as an expression of the growth of the relative size of the public sector. This suggests that as per capita income in an economy grows, the public sector size would also grow in tandem. Suffice to note that though Wagner (1883) did not measure the magnitude of this relationship, his analysis suggests that political and economic factors were the major determining forces that explained the persistent and upward movement in the ratio of public expenditure.

Specifically, some of the reasons adduced for the growth in public expenditure overtime are: inflation; public debt; tax revenue and the population. These factors are discussed hereunder.

Inflation can be defined as a sharp and persistent rise is the general price of goods and services characterized by prevalent increases in the prices generally and not just a temporary fluctuation (Patience and Augustine, 2008). Inflation is one of the most crucial macro-economic problems facing most countries of the world especially the underdeveloped and developing countries. Some of the adverse effects include decreasing purchasing power of the country's currency, unemployment and uneven distribution of income. The extent to which inflation affects the size of public expenditure in less developed countries such as Nigeria was investigated by Ezirim and Ofurum (2003). The result indicated that inflation was a notable factor found to be significant. Based on the finding, the authors took liberty to postulate that inflation is a most important factor of interest that accounts for changes in government expenditure in developing countries.

According to Anyanwu (1997), the act of borrowing creates debt. Debt therefore, refers to the resources of money in use in an organization which is not contributed by its owners and does not in any other way belong to them (Oyejide *et al.*, 1985). It is a liability represented by a financial instrument or other formal equivalent. Public debt on its own is not the problem but servicing this debt is what poses a challenge and increase government expenditure overtime. Once incurred, debt must be serviced through the payment of interest and amortization charges as at when due (Anyanwu, 1997). When the government incurs a larger and larger debt through continual net borrowing, the interest charges on the public debt naturally grow, provided that the interest rate is not falling. This leads to a subsequent increase in public expenditure.

Tax is a compulsory levy. It is a liability imposed upon the masses that may be individuals or other legal entities (Oriakhi, 2004). The fund gotten from this levy is what is termed tax revenue. The primary objective of taxation is to raise revenue for the government to sponsor the provision of essential services for the people. Also, Abeng (2005) in his study revealed that tax revenue is highly significant indicating the strong impact it has on government's expenditure. According to him, a percentage increase in government tax revenue could potentially expand government expenditure by as much as 29%. This result accentuates Peacock and Wiseman (1961) hypothesis of government inherent tendency to spend once revenue is available and rightly mirrors the expenditure behaviour of the Nigerian economy.

Changes in population growth, according to Musgrave and Musgrave (1989), generate changes in age distribution and this trend is reflected in expenditure for education as well as care for the aged. Population growth is a major and dominant contributory factor to the growth of expenditure as government policies are geared towards narrowing, as much as possible, the gap between social and economic services with population growth. The provision of schools, hospital and other social amenities necessary has to grow with population. The result of Abeng (2005) research also indicates that in Nigeria, demographic factor (population) is an important determinant of public expenditure growth exerting a direct, strong positive and significant relationship with the level of government expenditure.

MATERIALS AND METHODS

The period of interest is from 1999 to 2008, this will enable us analyze the trends and impact of government expenditure growth since the civilian administration came to power in Nigeria. The significant of this period is underscored by the fact that, not only does it remain substantially unexplored in public finance research but also witnessed the restoration of yet another democratic governance in Nigeria.

This analysis is based on documented secondary data culled from several sources such as Central Bank of Nigeria (CBN) statistical bulletin and Federal Bureau of Statistics publications. Secondary data beyond 2008 are not yet available. We used the Ordinary Least Square (OLS) regression techniques to ascertain the determinants of Nigerian government expenditure growth.

The theoretical model for this study is:

$$TGEX = f(INF, POP, PD, TREV, Et) \quad (1)$$

Where:
TGEX = Total Government Expenditure Growth Rate (%)
INF = Inflation rate (%)
POP = Population growth rate (%)
PD = Public debt growth rate (%)
TREV = Tax revenue growth rate (%)
Et = Error term

Equation 1 can be rewritten in a regression form to Eq. 2

$$TGEX = 0+\alpha_1 INF+\alpha_2 UNEMP+\alpha_3 POP+\alpha_4 PD+\alpha_5 TREV+\alpha_6 DPOL+Et \quad (2)$$

RESULTS

The study used the Ordinary Least Square (OLS) regression method to analyze the data from 1999-2008. The initial ordinary least squares regression result (Appendix A) is presented as:

$$TGEX = -577086.0+10.2\ POP-8088.2\ INF+0.1PD+0.3\ TREV$$
$$(-0.47)(0.89) \quad (-0.87)(0.94) \quad (3.72)^*$$
$$R^2 = 0.98$$
$$F(4, 5) = 63.4^*$$
$$DW\text{-}Statistics = 2.9$$

Table 1: OLS regression result

Variables	Coefficient	t-ratio	p-value
Constant	-577086	0.47	0.66
POP	10.2	0.89	0.41
INF	-8088.2	0.87	0.42
PD	0.1	0.94	0.39
TREV	0.3	3.72	0.01*

* = Significant at p<0.05

Table 2: Newton raphson iterative method result

Variables	Coefficient	t-ratio	p-values
Constant	-1431259	-4.00	0.01*
POP	17.7	5.00	0.00*
INF	-10530.1	-2.01	0.10
PD	0.1	2.64	0.05*
TREV	0.3	7.96	0.00*

* = Significant at p<0.05

Table 1 shows none of the variable was significant except total revenue growth (TREV) at 5% level. The F statistics indicates that the independent variables considered together explained a significant amount of variation in total government expenditure growth rate (TGEX) at 5% level of significant. The coefficient of determination (R^2) shows that 98% of the variation in TGEX is accounted for by the variables. To improve on the result, we used the Newton Raphson (Appendix B) iterative method and the best result obtained is as below:

$$TGEX = -1431259 + 17.7POP - 10530.1\,INF + 0.1PD + 0.3\,TREV$$
$$(-4.00)\,(5.00)^* \qquad (-2.01)(2.64)^* \qquad (7.96)^*$$
$$R^2 = 0.997$$
$$F\,(6, 3) = 188.2^*$$
$$DW\text{-}Statistics = 2.8$$

The t-values are presented in parenthesis below the coefficients.

Interestingly Table 2 shows that all the variables pass their a priori expectations with the correct signs except inflation. However, all the independent variables are significant at the 5% level of significance except inflation (INF). Since these values are greater than the t critical value of 1.94 using the one-tailed test, then they pass the significance test. This shows that they are the major determining factor of TGEX in the Nigeria economy.

The F statistics indicates that the independent variables considered together explained a significant amount of variation in Total Government Expenditure Growth Rate (TGEX) at 5% level of significant. The R^2 shows that about 99% variations in TGEX can be explained by the independent variables used.

The summary of our findings are:

- Population has a positive relationship with total government expenditure (TGEX). Thus, as the population increases the total expenditure increases
- Inflation has a negative relationship with TGEX instead of a positive one
- Public debt has a significantly positive relationship with TGEX
- Tax revenue growth rate has a significantly positive relationship with (TGEX)

DISCUSSION

The goal of this research is to identify the determinants of the growth of Nigerian government expenditure since the present civilian regime came to power in 1999. Although, there are some works that discuss this thematic, this work offers an original contribution in order to empirically point the relevant determinants.

The result indicates that population has a positive impact on total expenditure. Thus, as the population increases, the total expenditure also increases. This finding agrees with those of Musgrave and Musgrave (1989) and Abeng (2005) which say that population is an important determinant of growth in government expenditure.

Another finding from the study is the antithetical relationship between inflation and total government expenditure. Inflation has a negative relationship with total government expenditure instead of a positive one. This disagrees with the finding of Ezirim and Ofurum (2003) which indicates that inflation is an important factor of interest that accounts for changes in government expenditure in developing countries but agrees with Abeng (2005) who states that inflation rate though statistically significant, is not a good explanatory factor in the direction and size of government expenditure.

A further instructive finding from the analysis is the positively significant relationship of public debt on total government expenditure. Again, this agrees with the findings of Okoh (2008) which says that modern day governments have become so used to borrowing in the execution of policies and with the interest payment on debt, public expenditure increases.

Moreover, tax revenue was found to have a significantly positive relationship with total government expenditure. This agrees with Abeng (2005) and Peacock and Wiseman (1961) who found significant positive relationship tax revenue and total government expenditure. It also agrees with Barro (1979) indicates that taxes follow spending.

RECOMMENDATION

The present results present some policy implications. It is worthy of note that the empirical results affirmed that expenditure is quite sensitive to the influence of population, inflation, public debt and tax revenue. Thus, the government of the Federal Republic of Nigeria can comfortably regulate the levels of her expenditure by controlling inflation, public debt, population, tax revenue and other causes of economic instability in the country.

Secondly, government persistent recording of large fiscal deficit pose real threats to the stability and growth of the economy. Excessive budget deficits could lead to a combination of inflation, exchange rate crises, internal and external debt overhang as well as high interest rate in the economy. Deficits could be reduced by cutting down on expenditure without compromising the funding of key expenditure programmes for growth and poverty reduction, complemented by tax reforms to increase revenue. This would free more funds for developmental projects as well as the provision of social and economic infrastructures which are the building blocks for any meaningful development.

There is need to pass into law, on time, the enabling fiscal responsibility bill to sanitize and enthrone financial probity in the three arms of government. Transparency in governance and fiscal discipline should be the key watch words of government.

CONCLUSION

The total expenditure of government was N947.69b in 1999 and this rose to N3.24tr in 2008. This shows an astronomical increase of over N2.293tr or over 241.9% during the period under

review. This huge increase has not reflected much in the real domestic product which was N 313,183.5 m in 1999 and rose to N674, 889.0 m in 2008 representing an increase of 116.18%. We identified that population; tax revenue and public debt have positive relationship while inflation has negative relationship with total government expenditure. In other words, an increase in those three variables will result in an increase in government expenditure. However, when inflation decreases, government expenditure increases. The reason for the latter finding may not be unconnected with unrealistic inflation rate given by relevant government agencies as this in not in line with a priori expectations.

APPENDIX A

Ordinary Least Squares Estimation
****
Dependent variable is TOTEXP
10 observations used for estimation from 1999 to 2008
****
Regressor Coefficient Standard Error T-Ratio[Prob]
TGEX -577086.0 1237036 -.46651[.660]
POP 10.1927 11.4142. 89298[.413]
INF -8088.2 9247.2 -.87467[.422]
PD. 057129. 060964. 93710[.392]
TREV. 33740. 090781 3.7166[.014]
****
R-Squared. 98067 R-Bar-Squared. 96521
S.E. of Regression 147870.7 F-stat. F(4, 5) 63.4217[.000]
Mean of Dependent Variable 1578892 S.D. of Dependent Variable 792771.6
Residual Sum of Squares 1.09E+11 Equation Log-likelihood -129.7646
Akaike Info. Criterion -134.7646 Schwarz Bayesian Criterion -135.5210
DW-statistic 2.8914
****
Diagnostic Tests
****
* Test Statistics * LM Version * F Version *
****
* * * *
* A:Serial Correlation*CHSQ(1)= 4.2445[.039]*F(1, 4)= 2.9499[.161]*
* * * *
* B:Functional Form *CHSQ(1)= 2.6103[.106]*F(1, 4)= 1.4129[.300]*
* * * *
* C:Normality *CHSQ(2)=. 57871[.749]* Not applicable *
* * * *
* D:Heteroscedasticity*CHSQ(1)=. 42217[.516]*F(1, 8)=. 35262[.569]*
****
A:Lagrange multiplier test of residual serial correlation
B:Ramsey's RESET test using the square of the fitted values
C:Based on a test of skewness and kurtosis of residuals
D:Based on the regression of squared residuals on squared fitted values

APPENDIX B

```
Exact AR(2) Newton-Raphson Iterative Method converged after 19 iterations
********************************************************************************
Dependent variable is TOTEXP
10 observations used for estimation from 1999 to 2008
********************************************************************************
Regressor Coefficient Standard Error T-Ratio[Prob]
TGEX -1431259 358183.9 -3.9959[.010]
POP 17.6912 3.5416 4.9952[.004]
INF -10530.1 5249.0 -2.0061[.101]
PD. 063443. 024037 2.6394[.046]
TREV. 28790. 036164 7.9609[.001]
********************************************************************************
R-Squared. 99735 R-Bar-Squared. 99205
S.E. of Regression 70691.0 F-stat. F( 6, 3) 188.1510[.001]
Mean of Dependent Variable 1578892 S.D. of Dependent Variable 792771.6
Residual Sum of Squares 1.50E+10 Equation Log-likelihood -121.7095
Akaike Info. Criterion -128.7095 Schwarz Bayesian Criterion -129.7685
DW-statistic 2.8361
********************************************************************************
Parameters of the Autoregressive Error Specification
********************************************************************************
U= -1.6083*U(-1)+ -.82134*U(-2)+E
( -8.9158)[.003] ( -4.5531)[.020]
T-ratio(s) based on asymptotic standard errors in brackets
Log-likelihood ratio test of AR(1) versus OLS CHI-SQ(1)= 8.6278[.003]
Log-likelihood ratio test of AR(2) versus AR(1) CHI-SQ(1)= 7.4824[.006]
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